GOL VCSEL Tests

HCAL Front-end Electronics

GOL -> VCSEL optical tests

Theresa Shaw

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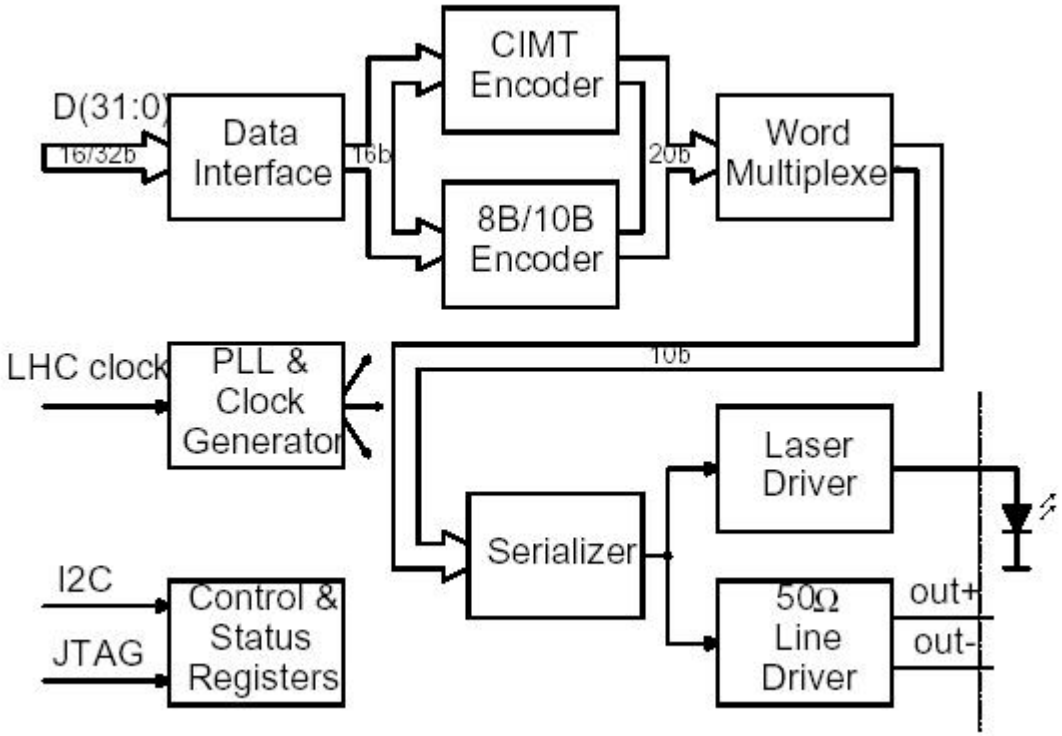
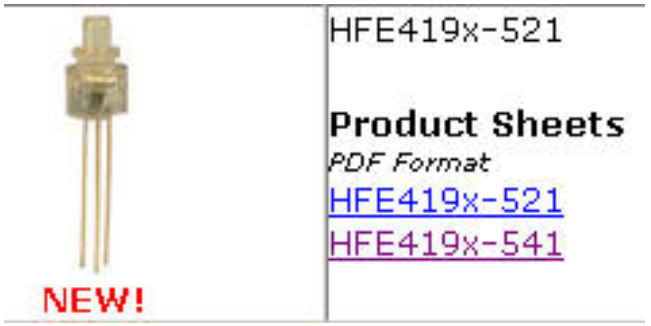
GOL and VCSEL

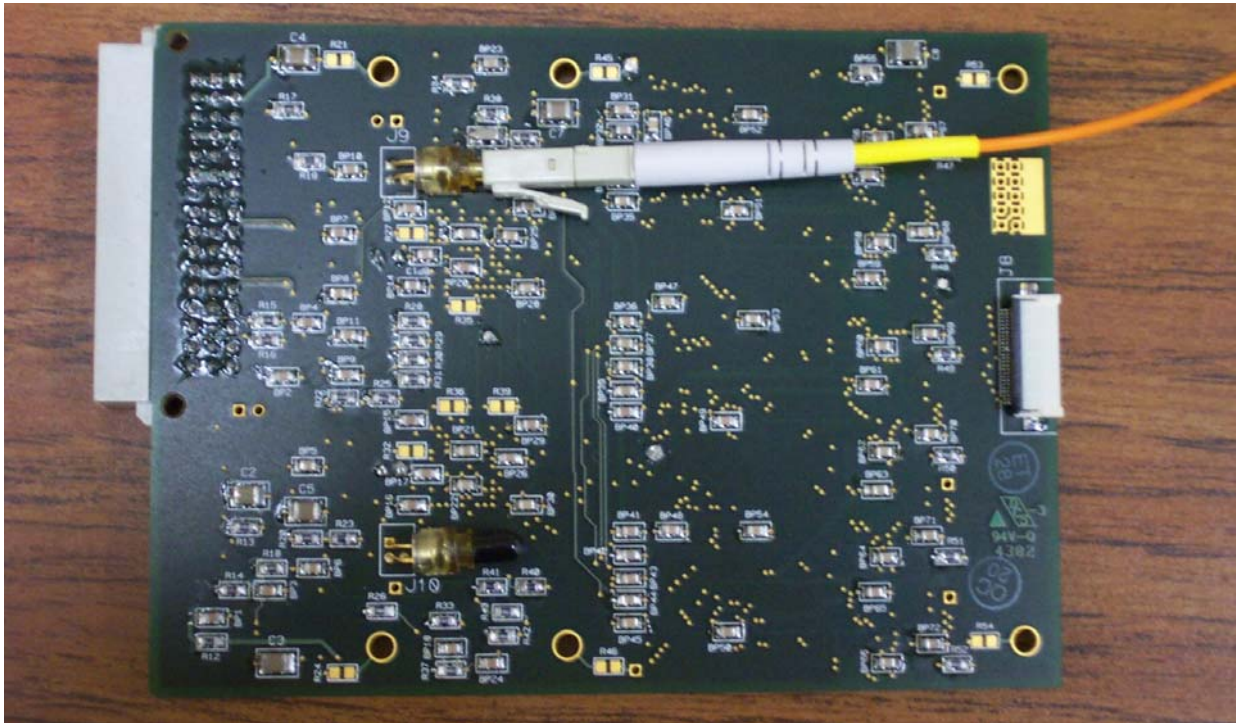
CMS HCAL Front end electronics use a Honeywell VCSEL (HFE4191-541) driven by the GOL





Optical Fiber

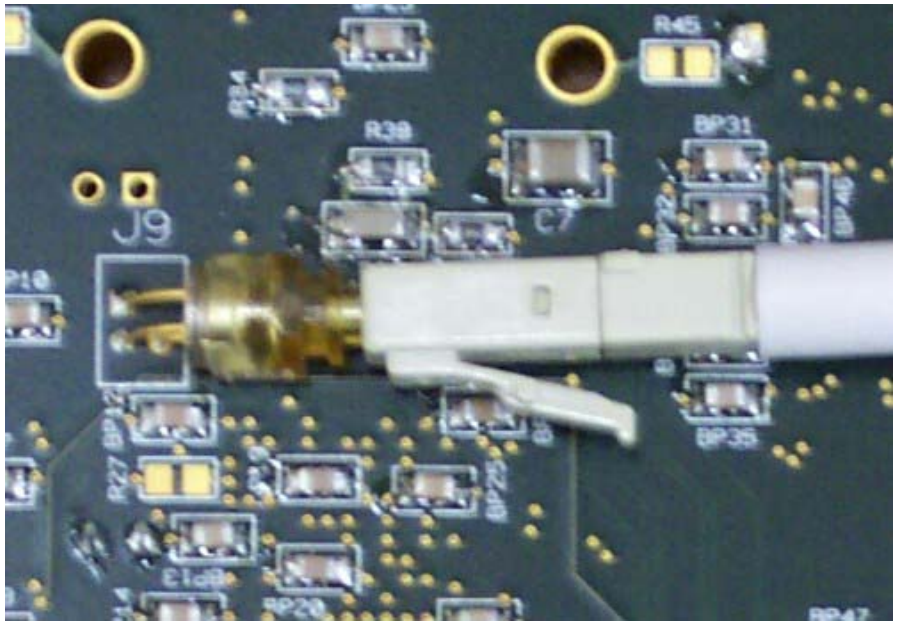
Optical data fiber plugs into VCSEL, located on the back of a Front end module.



VCSEL Fiber Connection

The ferule of the optical fiber is placed into the LC connectorized VCSEL.

- **This is not a locking connection – we must fix the fiber in place. Possible solutions include heat shrink, glue, RTV….**



VCSEL Optical Power

H C A L

VCSEL Optical Power is measured to be 572μW with short (1m) optical cable.

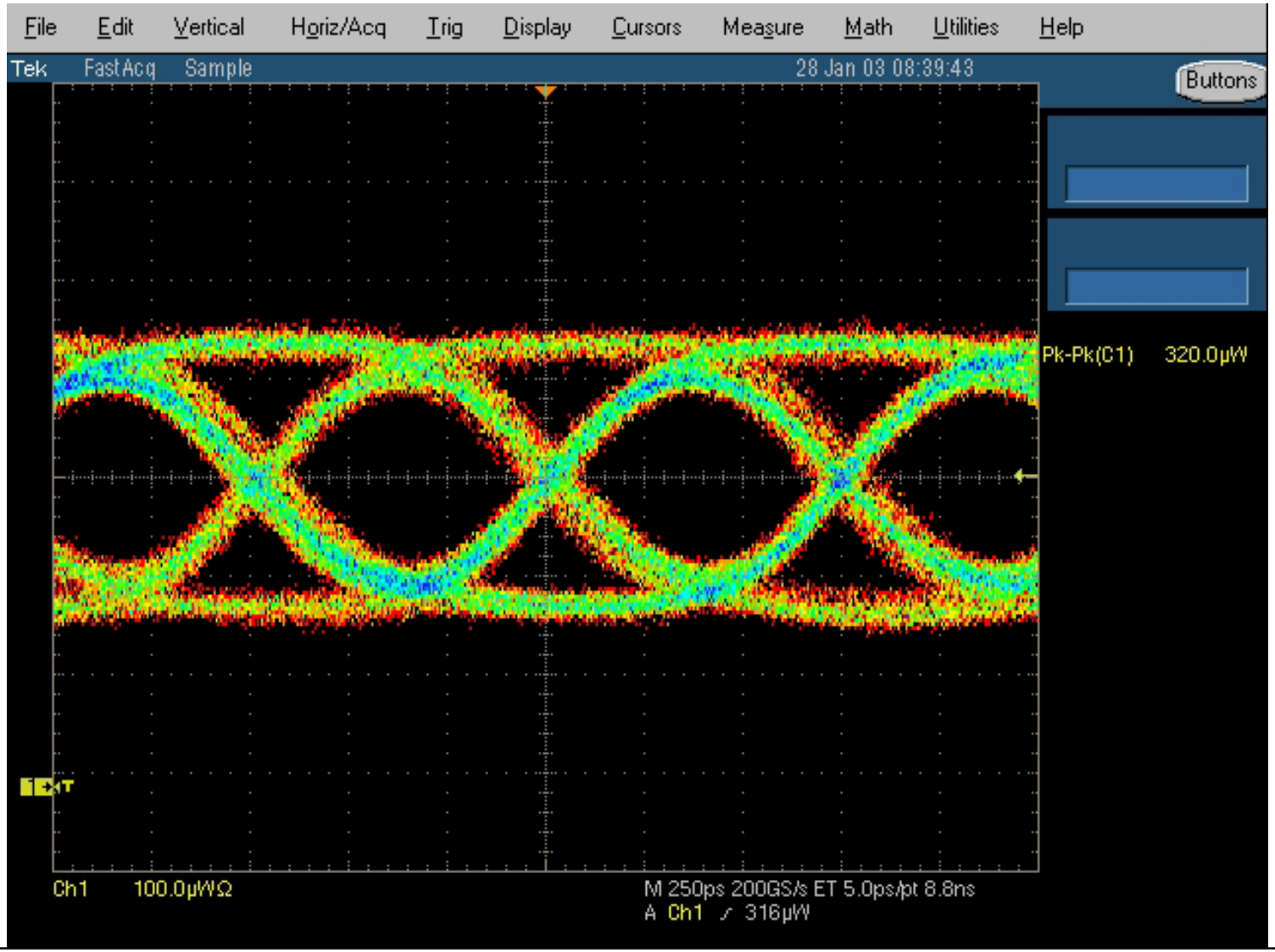
Comparison of VCSEL driving methods on FE modules

Pre-Production module uses a 8 mil trace to drive the VCSEL (no special impedance control)

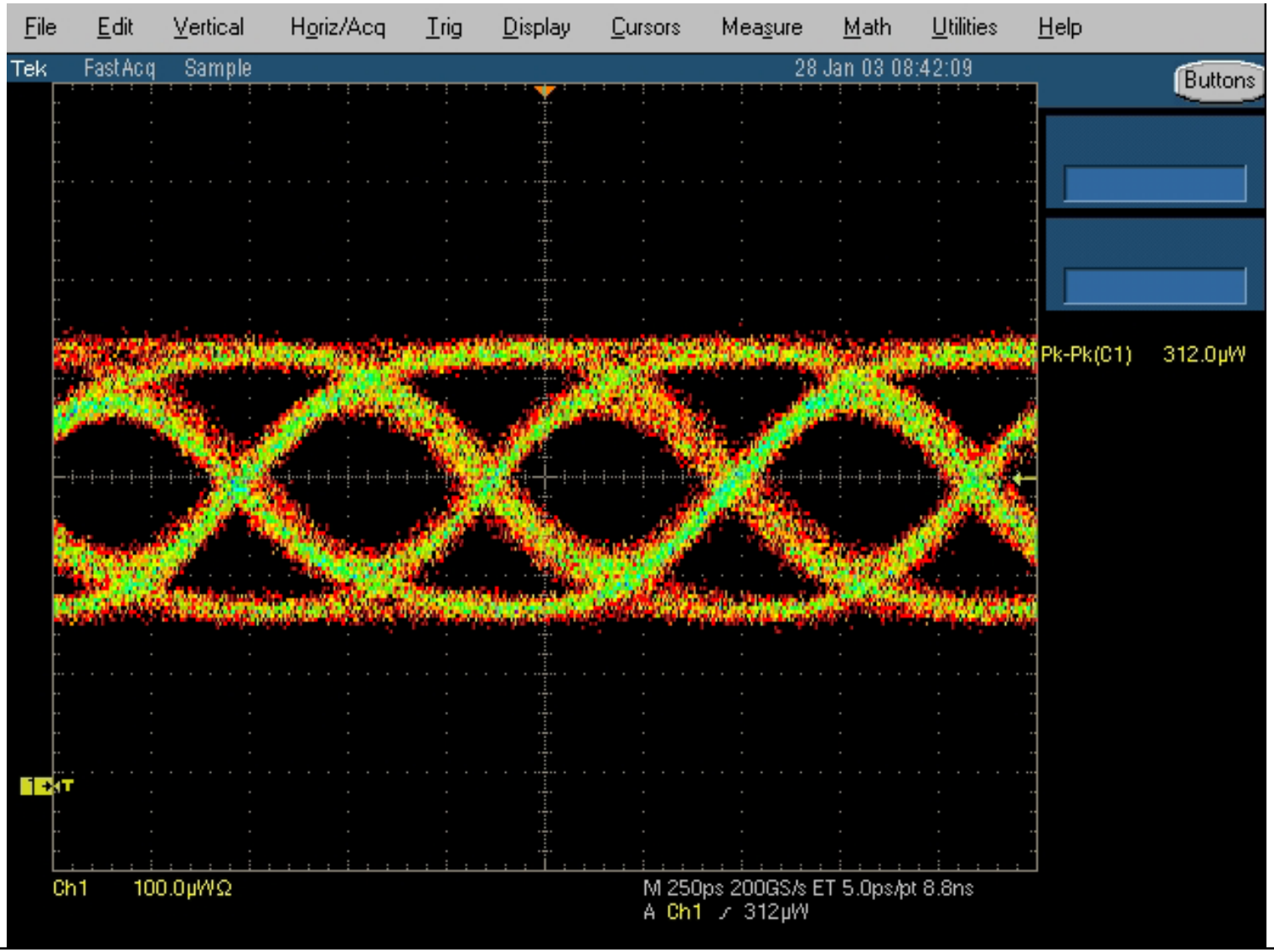
Production Module uses a 25ohm impedance controlled trace with a possible 25ohm in-line termination resistor

Measurements taken with 3m LC-LC (50u) cable, connected to 1m LC-ST (62.5u) cable, 1m (62.5u) scope probe

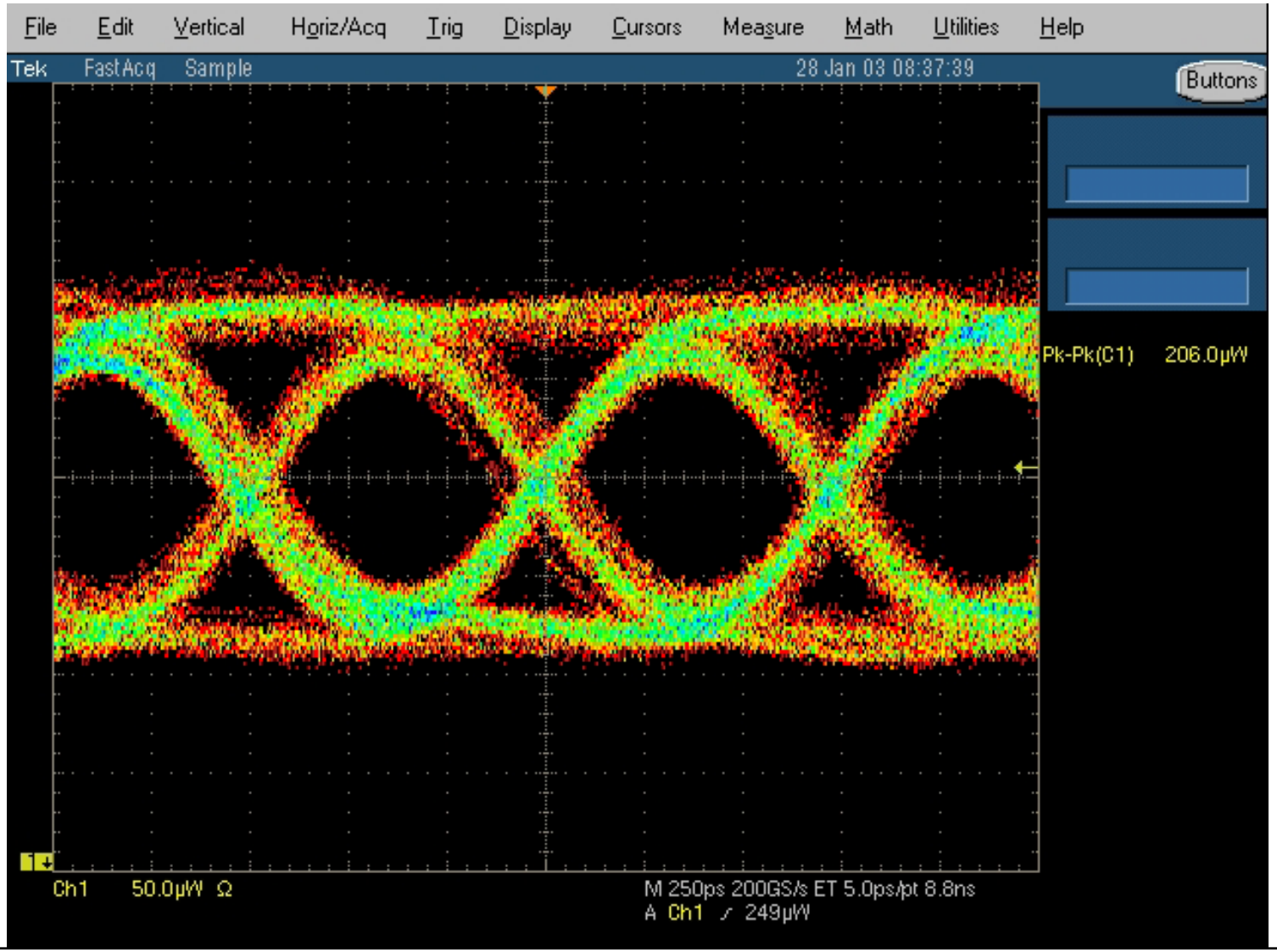
Pre-Production 33Mhz



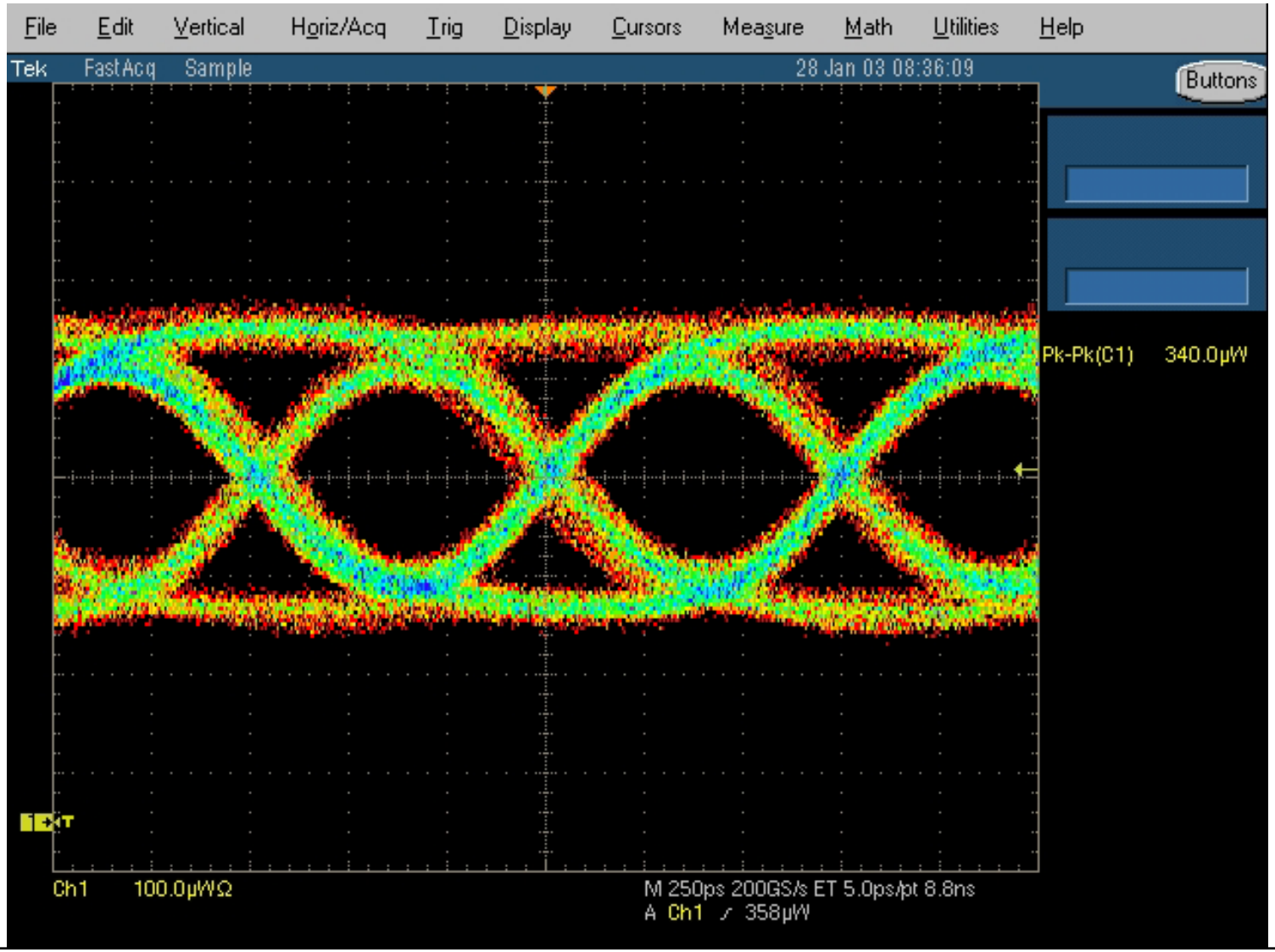
Pre-Production 40Mhz



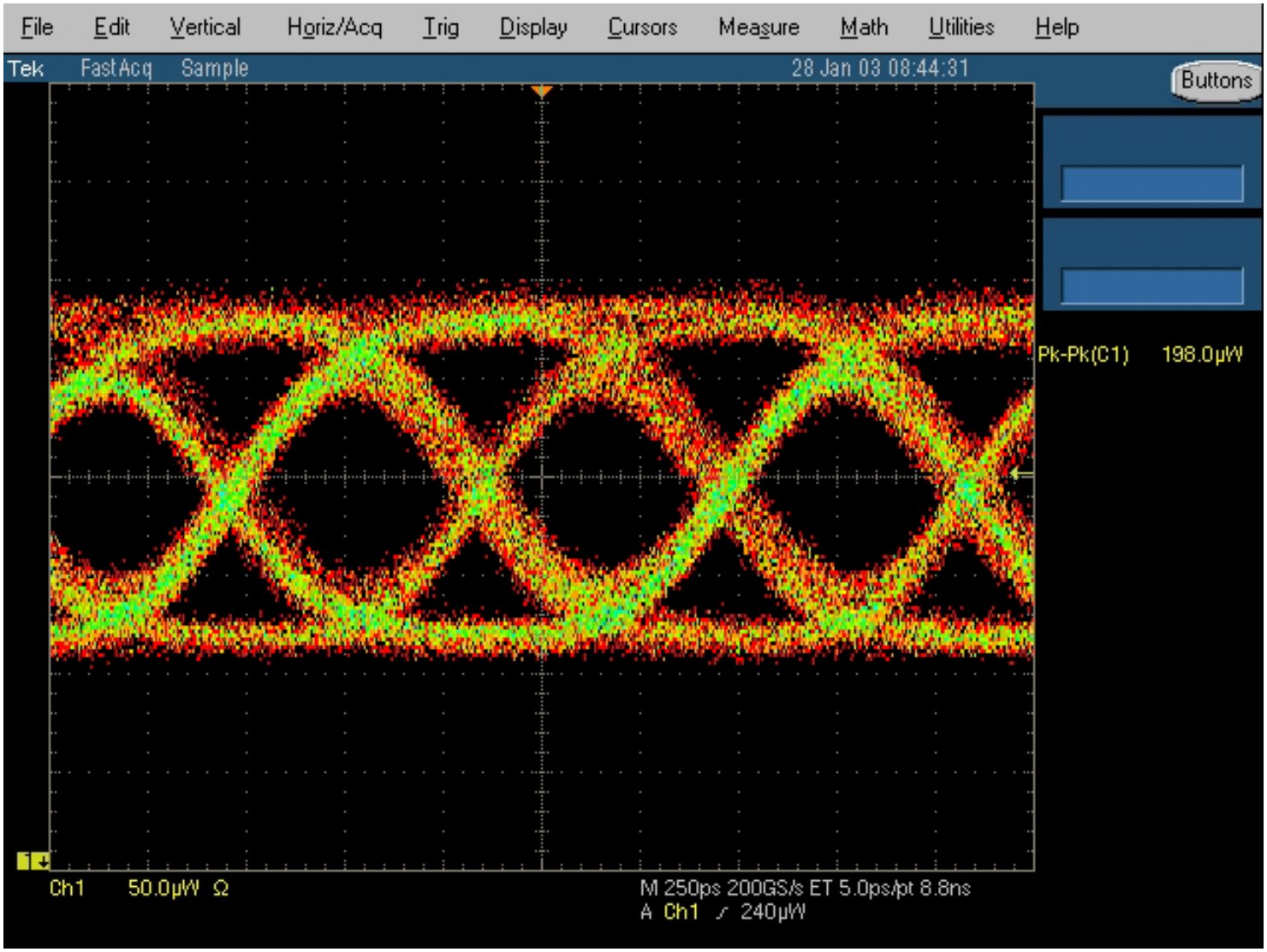
Production 33Mhz
25 ohm series resistor
25 ohm trace



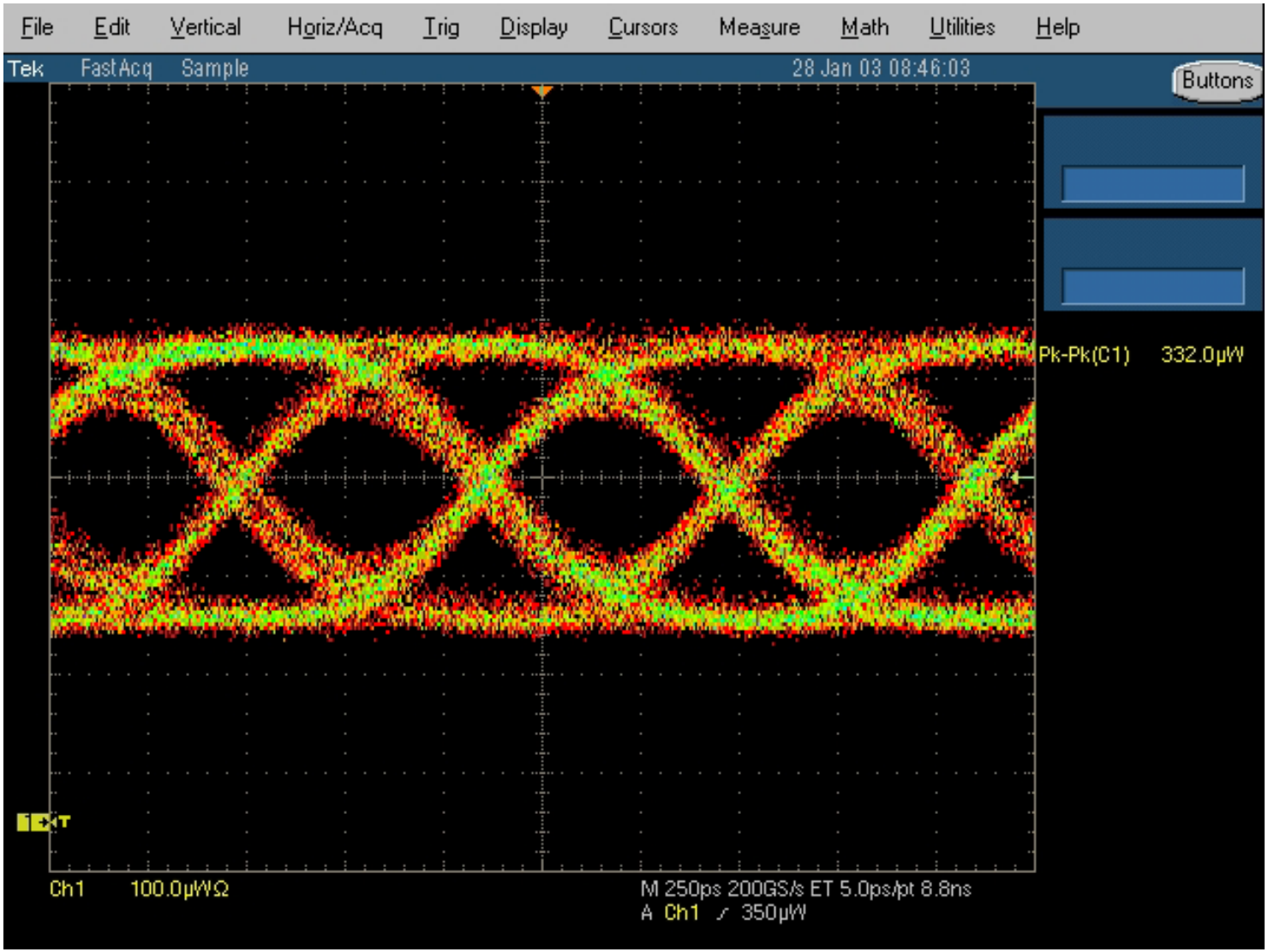
Production 33Mhz
zero ohm series resistor
25 ohm trace



Production 40Mhz
25 ohm series resistor
25 ohm trace



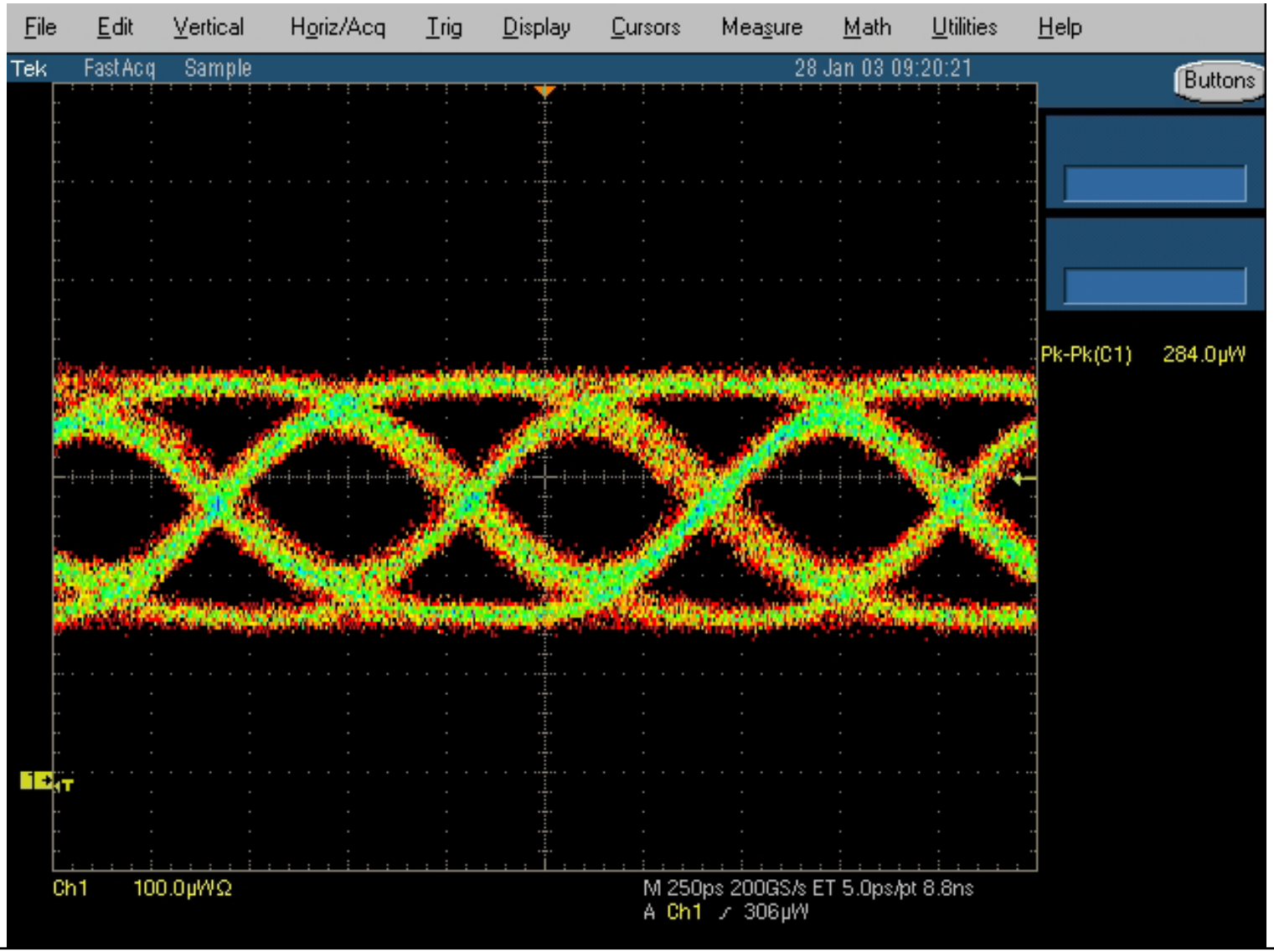
Production 40Mhz
zero ohm series resistor
25 ohm trace



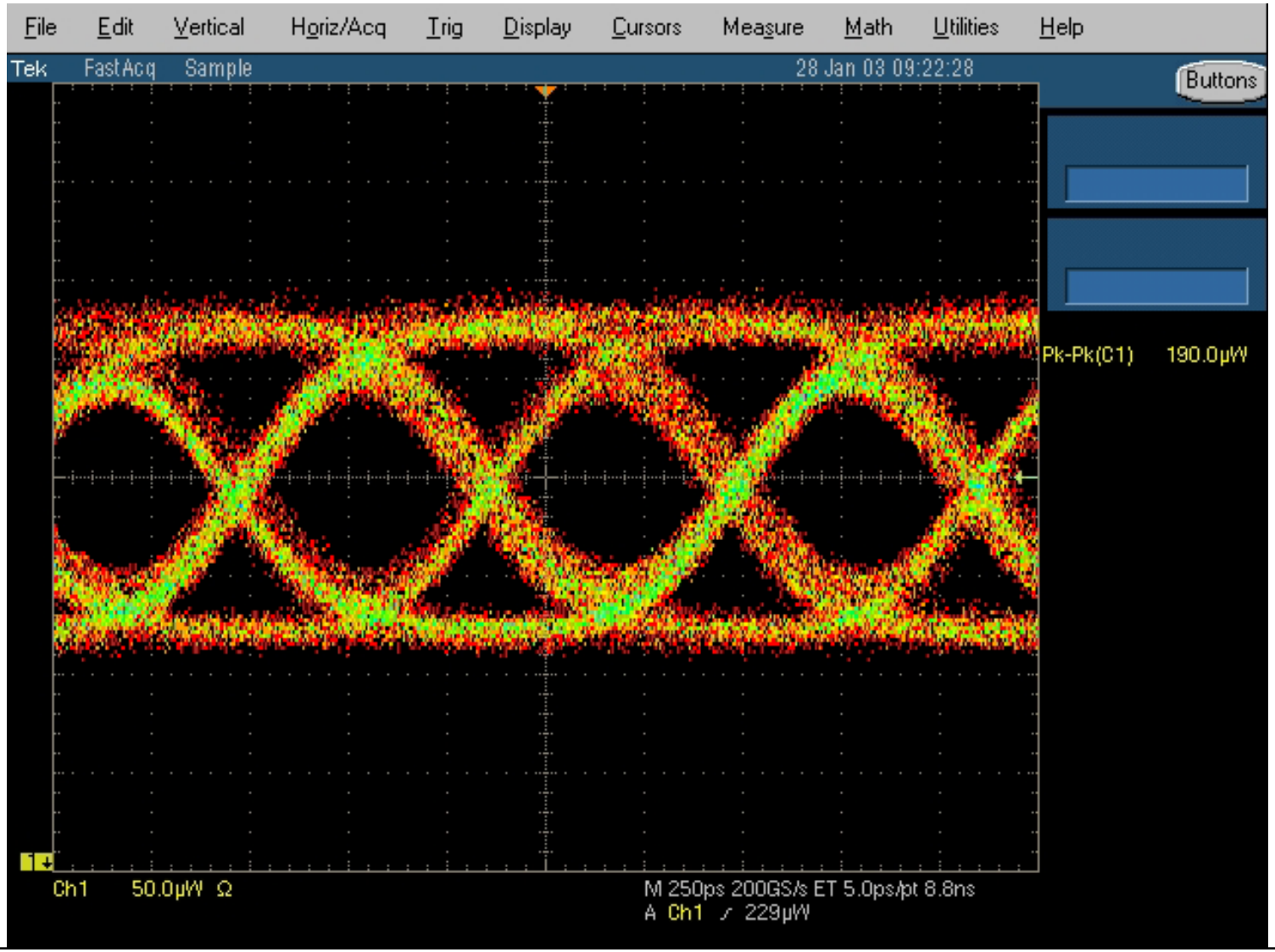
Add 50m cable

The next plots show the same measurements running at 40MHz with a 50 meter 50u cable added.

Pre-Production 40Mhz



Production 40Mhz
25 ohm series resistor
25 ohm trace



Production 40Mhz
zero ohm series resistor
25 ohm trace